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UNIVERSITY OF TORONTO  
UNIVERSITY EXTENSION

**Session 1960-61**

Course on

**HEAT AND MASS  
TRANSFER OPERATIONS  
IN CHEMICAL  
ENGINEERING**

sponsored by the  
CHEMICAL INSTITUTE OF CANADA,  
TORONTO SECTION

## HEAT AND MASS TRANSFER OPERATIONS IN CHEMICAL ENGINEERING

Wednesdays

20 lectures

This course which is offered in co-operation with the Chemical Institute of Canada, Toronto Section, has been designed for graduate chemists and chemical engineers. It is a refresher course and is one of the series sponsored by the Institute and given annually through the Division of University Extension. The programme of lectures has been arranged by staff members of the Departments of Chemistry, Chemical Engineering and Geophysics, University of Toronto.

**TIME:** 7.30 p.m.  
Fall Term: October 12th – December 14th  
Winter Term: January 11th – March 15th.

**PLACE:** Room 2034, Wallberg Building.

**FEE:** \$40.00

### Registration:

By mail or in person at Room 207, 65 St. George Street, 9 a.m. to 5 p.m. daily except Saturdays. Information may be obtained by telephoning WA. 3-6611, locals 301, 304, 526, 527. In order to accommodate students and enable them to enrol during the evening, registrations will be taken:

Monday, September 12th

Monday, September 19th

from 7.30 to 9 p.m. in the Wallberg Building, corner of St. George and College Streets.

## PROGRAMME

These lectures will review the fundamental theories of fluid flow, heat and mass transfer and survey the application of these theories to the design and operation of heat exchange and mass transfer equipment.

An attempt will be made to generalize the theory and calculation techniques. The more useful engineering correlations will be discussed in view of such unified theory and will be demonstrated by problems.

The transient behaviour of heat exchange and stagewise mass transfer equipment, and the control implications of this behaviour will be discussed and demonstrated.

A problem will follow each lecture. It is planned to demonstrate many of the problems on a small electronic analog.

Theory and design applications in the following areas will be discussed:

### SOME FUNDAMENTAL CONSIDERATIONS:

Viscosity, thermal conductivity, molecular diffusion

### LAMINAR FLOW AND TURBULENT FLOW

### UNSTEADY STATE MOLECULAR HEAT AND MASS TRANSFER

### HEAT TRANSFER IN STEADY FLOW SYSTEMS

### A REVIEW OF PHASE EQUILIBRIUM

### MASS TRANSFER IN STEADY FLOW SYSTEMS

### SIMULTANEOUS HEAT AND MASS TRANSFER

### STAGewise MASS TRANSFER OPERATIONS

### TRANSIENT BEHAVIOUR OF SELECTED HEAT AND MASS TRANSFER OPERATIONS

### LECTUREN:

Professor A. I. Johnson,  
Department of Chemical Engineering,  
University of Toronto.